WHAT IS CLAIMED:

1. In a bi-directional wavelength division multiplexing optical communication system of the type having first and second optical transmitter/receiver units for transmitting and receiving wavelength-division-multiplexed optical signals, respectively, and an optical fiber serving as a transmission medium for a forward optical signal traveling from the first optical transmitter/receiver unit to the second optical transmitter/receiver unit and a reverse optical signal traveling from the second optical transmitter/receiver unit to the first optical transmitter/receiver unit, each of the forward and reverse optical signals being composed of a plurality of channels with different wavelengths, and an optical amplifier device for amplifying the forward and reverse optical signals, comprising:

a first interleaver for interleaving the channels of the forward optical signal received at a first terminal thereof and the channels of the reverse optical signal received at a second terminal thereof, in accordance with the wavelengths of the channels, and outputting an interleaved optical signal at a third terminal thereof;

an optical fiber amplifier unit for amplifying the interleaved optical signal received from the third terminal of the first interleaver and outputting the amplified optical signal; and,

a second interleaver for splitting the amplified optical signal, received at a third terminal thereof, into the forward and reverse optical signals in accordance with wavelengths and outputting the forward and reverse optical signals at first and second terminals thereof, respectively.

2. The optical amplifier device according to claim 1, further comprising:

a first circulator for transmitting the forward optical signal, received thereto via the optical fiber, to the first terminal of the first interleaver while transmitting the reverse optical signal, received from the first terminal of the second interleaver, to the optical fiber; and,

a second circulator for transmitting the reverse optical signal, received thereto via the optical fiber, to the second terminal of the first interleaver while transmitting the reverse optical signal, received from the second terminal of the second interleaver, to the optical fiber.

3. The optical amplifier device according to claim 1, further comprising:

a dispersion-compensation module coupled between the third terminal of the first interleaver and the third terminal of the second interleaver and adapted to compensate for a dispersion of the interleaved optical signal.

4. The optical amplifier device according to claim 2, further comprising:

a dispersion-compensation module coupled between the third terminal of the first interleaver and the third terminal of the second interleaver and adapted to compensate for a dispersion of the interleaved optical signal.

5. A bi-directional wavelength-division multiplexing optical communication system comprising:

a first optical transmitter/receiver unit for transmitting a forward optical signal composed of a plurality of channels respectively allocated with wavelengths having a desired wavelength space while receiving a reverse optical signal composed of a plurality of channels respectively allocated with wavelengths each interleaved between associated ones of the wavelengths of the forward optical signal;

a second optical transmitter/receiver unit for transmitting the reverse optical signal while receiving the forward optical signal;

an optical fiber coupled between the first and second optical transmitter/receiver units, the optical fiber serving as a transmission medium for the forward and reverse optical signals; and,

an optical amplifier device arranged on the optical fiber and adapted to interleave the channels of the forward and reverse optical signals, bi-directionally received via the optical fiber, in accordance with the wavelengths of the channels, to amplify an interleaved optical signal generated in accordance with the interleaving operation, to split the amplified optical signal into the forward and reverse optical signals in accordance with wavelengths, and to bi-directionally transmit the split forward and reverse optical signals via the optical fiber.

6. The system according to claim 5, wherein the optical-amplifier device comprises:

a first interleaver for interleaving the channels of the forward optical signal received at a first terminal thereof and the channels of the reverse optical signal received at a second terminal thereof, in accordance with the wavelengths of the channels to generate the interleaved optical signal, and outputting an interleaved optical signal at a third terminal thereof;

an optical fiber amplifier unit for amplifying the interleaved optical signal received from the third terminal of the first interleaver, and outputting the amplified optical signal; and,

a second interleaver for splitting the amplified optical signal, received at a third terminal thereof, into the forward and reverse optical signals in accordance with wavelengths, and outputting the forward and reverse optical signals at first and second terminals thereof, respectively;

a first circulator for transmitting the forward optical signal, received thereto via the optical fiber, to the first terminal of the first interleaver while transmitting the reverse optical signal, received from the first terminal of the second interleaver, to the optical fiber; and,

a second circulator for transmitting the reverse optical signal, received thereto via the optical fiber, to the second terminal of the first interleaver while transmitting the reverse optical signal, received from the second terminal of the second interleaver, to the optical fiber.

7. The system according to claim 6, wherein the optical amplifier device further comprises:

a dispersion compensation module coupled between the third terminal of the first interleaver and the third terminal of the second interleaver and adapted to compensate for a dispersion of the interleaved optical signal.